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[claim 1] *(amended)* A wavelength locked thermally tunable laser comprising:

A semiconductor laser, whose output wavelength adjusted thermally and continuously;

A wavelength locker, comprising:

> (a) a *solid* etalon, *whose free space range or its physical thickness relates to the temperature characteristics of said semiconductor laser;*
>
> (b) a first photo detector for detecting a collimated light *extracted* from said semiconductor laser and transmitting through said solid etalon;
>
> (c) a second photo detector for detecting the power output of said semiconductor laser;

Said semiconductor laser and wavelength locker packaged on one single platform;

The temperature of said platform, semiconductor laser and solid etalon adjusted by a thermal electrical cooler;

A temperature detecting element disposed near said solid etalon for detecting the ambient temperature of said etalon;

A *means* of locking the wavelength of said semiconductor laser to a specific wavelength by an outside electronic controller. *(following deleted)*

[claim 2] A wavelength locked thermally tunable laser of claim 1 wherein said solid etalon having a free spectrum range FSR or physical thickness t(T) at a temperature T is defined by a first partial reflector and a second partial reflector, said reflectors formed on the two parallel surfaces of a piece of transparent material.

[claim 3] *(amended)* The *solid* etalon of claim 2 wherein the FSR of said *solid* etalon

$$FSR = \Delta v - \frac{\Delta v}{(dv/dT)_{laser}} \times (dv/dT)_{etalon},$$

where Δv is the channel spacing, such as 100GHz, 50GHz etc.; $(dv/dT)_{laser}$ the temperature dependence of the emission frequency of said semiconductor laser; and $(dv/dT)_{etalon}$ the temperature dependence of said *solid* etalon's resonance peak frequency.

[claim 4] *(amended)* The *solid* etalon of claim 2 wherein the physical thickness t(T) of said solid etalon

$$t(T_1) = \frac{L\lambda_1\lambda_2 + 2n(\lambda_2,T_2)\alpha\Delta T\lambda_1}{2n(\lambda_1,T_1)\lambda_2 - 2n(\lambda_2,T_2)\lambda_1},$$

where λ_1 is the output wavelength at temperature T_1 of said semiconductor laser; $\Delta\lambda$ is the channel spacing corresponding to 100Ghz, 50GHz, etc.; $\lambda_2=\lambda_1+L\Delta\lambda$ is the output wavelength at T_2 of said semiconductor laser; α is the thermal expansion coefficient of the material of said solid etalon; L is an integer(=1, 2, ...); $\Delta T=T_2-T_1$ is the temperature change required to change the output wavelength from λ_1 to λ_2 of said semiconductor laser; $n(\lambda_1, T_1)$ and $n(\lambda_2, T_2)$ are the refractive index of the material of said solid etalon at λ_1, T_1 and λ_2, T_2, respectively.

[claim 5] *(amended) The wavelength locked thermally tunable laser of claim 1, further comprising a means to adjust a locking point value set at temperature T and wavelength λ according to a measured temperature T' by an amount of [I(λ, T')-I(λ, T)], where I(λ, T) is the normalized (against the power fluctuation) transmission intensity of said solid etalon at the locking wavelength λ and the temperature T and I(λ, T') is the normalized transmission intensity of said solid etalon at the locking wavelength λ and temperature T'.*